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APPLICATION FOR UNITED STATES LETTERS PATENT
FOR
AUTOMATED EVENT ORDERING SYSTEM AND METHOD

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TITLE OF THE INVENTION

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AUTOMATED EVENT ORDERING SYSTEM AND METHOD

BACKGROUND AND SUMMARY OF THE INVENTION

10 The present invention relates to a system and method for routing and processing telephone calls. More particularly, the present invention relates to method and system for using data stored in the system and/or supplied by the caller to route calls and to process calls for specific tasks, including, but not limited to, cable program ordering.

15 Automated telephone call centers have been known previously for the use of cable program ordering. The present invention provides a robust, automated, telephone system providing novel use of existing customer information, delegation of job duties between multiple components and component communication. The present system also provides the use of temporary data containers for the routing and processing of telephone calls to accomplish a myriad of functions including caller verification, account information look-up and cable program
20 ordering.

The present invention is preferably comprised of a switch for receiving calls, the switch adapted to receive the caller's calling number and the called number; an interactive voice response unit for providing recorded voice response, the interactive voice response unit configured with multiple applications; a data storage component configured with customer
25 information and event information, the customer information including account number and calling number data and the event information including event title; a temporary data container

for storing customer data received from the data storage component for use in call processing; and wherein the system is configured to retrieve the customer data from the data storage component based on the calling number and to store the customer data in the temporary data container for use in subsequent call processing applications

5 In addition to the features mentioned above, objects and advantages of the present invention will be readily apparent upon a reading of the following description.

BRIEF DESCRIPTION OF THE DRAWINGS

Novel features and advantages of the present invention, in addition to those mentioned above, will become apparent to those skilled in the art from a reading of the following detailed description in conjunction with the accompanying drawings wherein similar reference characters refer to similar parts and in which:

Figure 1 illustrates a block diagram illustrating the main components of a preferred embodiment of the present invention;

Figures 2A and 2B illustrate a call flow of one embodiment of the initial call control and call routing applications of the present invention;

Figures 3A-3C illustrate one embodiment of the ANI pay per view (PPV) ordering system of the present invention;

Figures 4A-4G illustrate one embodiment of a menu PPV ordering call flow of the present invention; and

Figure 5 illustrates a legend for the flowcharts of Figures 3A-3C and 4A-4G.

DETAIL DESCRIPTION OF PREFERRED EMBODIMENT(S)

The preferred system herein described is not intended to be exhaustive or to limit the invention to the precise forms disclosed. They are chosen and described to explain the principles

of the invention and the application of the method to practical uses so that others skilled in the art may practice the invention.

Figure 1 illustrates a block diagram illustrating the main components of a preferred embodiment of the present invention. The system **10** is preferably comprised of a telephone switch **12**; an interactive voice response (IVR) unit **14**, also known as a voice response unit (VRU) or an automated response unit (ARU); a local server **16** housing a local database; a CTI server and a data server **18** for storing customer and event data; and an agent station **20**.

The telephone switch may be a PBX or ACD programmed to perform the functions as set forth below. The telephone switch has incoming trunks and lines for accepting telephone calls and may be programmed to route calls. The IVR is a processing unit for playing automated voice messages to the caller as determined by programmed scripts. The local server is a special function computer programmed with database and CTI software and programmed according to the present invention as discussed herein. The data server is also a computer, such as an AS400 computer, programmed according to the present invention discussed herein.

Upon calling a predetermined number (i.e., called number, dialed number identification service (DNIS)) a called number table is referenced by the switch to determine the initial call control process (implemented via tables resident on the switch, i.e., call control tables (CCT)). In the preferred embodiment of the present invention, the initial call control process will call the call routing application of the present invention, which evaluates the calling number provided with the call (i.e., ANI or caller telephone number) or a telephone number entered by the caller, and associates it with a customer account number. The call routing application of the present invention is preferably implemented via a program resident on the IVR. **Figures 2A and 2B**

illustrate a call flow of one embodiment of the initial call control and call routing applications of the present invention.

The shaded portions of **Figures 2A and 2B** illustrate the logic executed by the initial call control process. The unshaded portions represents the call routing application of the IVR. The initial call control process obtains the calling party's telephone number, either automatically or by prompting the caller for it. The caller's number and the called number are each stored in data variables. These data variables store predetermined data for the duration of the call and are passed between the system components through data bridges. As one example, the following data may be stored in the following data variables:

Data Variable A:	Caller Phone Number
Data Variable B:	Account Number
Data Variable C:	Miscellaneous Data
Data Variable D:	Called Number
Data Variable E:	Data for Display on Agent Workstation upon Transfer.

Once the phone number of the calling party is obtained, the call routing application on the IVR is started (the initial call control process will send the ANI of the caller to the IVR via Data Variable A and send a command to start the call routing application).

During the call routing application, the IVR will interact with several data sources:

- 1.) local database;
- 2.) data server having customer and event information; and
- 3.) event voice files.

In an alternate embodiment, the voice files may be stored with the local database or the data server. A transaction with the data server is conducted to retrieve customer data. One

example of a data server is the ICOMS database interface program resident on an AS400 computer; the ICOMS databases interface is a known cable-industry database. The IVR may communicate with the data server using various data interfaces, for example, sockets over TCP/IP. In one embodiment the data protocol between the IVR and the data server is a

5 synchronous message protocol that consists of instruction strings and data strings in response.

The following tables illustrate an example transaction format between the IVR and the data server:

Transaction Format			
Title	Length	Type	Description
Source Identifier	1	char	A=ARU I=ICOMS
Line Number	3	digit	Right justified, zero filed 001-999=the line number the user is calling in on 000= Administrative function
Transaction Type	3	char	Indicates type of function being performed. It is followed by a comma (,).
Response Code	3	digit	Only on an ICOMS Response Transaction (Source ID-I) followed by a comma (,).
Data String	Variable		Series of data fields and instruction fields separated by commas (,). <ul style="list-style-type: none"> A data field is: Data Token (2 char) followed by a colon (:) Data Value (varies in size and type by Data Token) An Instruction field is: Instruction Token (2 char) with no following Data Value.
Period	1	char	(.)
Carriage Return	1	byte	Hexadecimal 0D

The fields used by the IVR for the PPV ordering application are indicated in **bold**. See

10 **Figures 3A-3C and 4A-4G.**

Transaction Types	
Token	Description
ACK	Acknowledge-required every 30-45 seconds to maintain connectivity to ICOMS
APP	Appointment Confirmation

BAL	Account Balance Inquiry
CAN	Cancel-optional transaction used to recover from a "lost" state
CMP	Complete Work Order
CRD	Credit Authorization
DTA	Data Request
EQP	Equipment Check-In/Out/Swap
HIT	Converter Reauthorization
ITT	Interactive Transaction
NPD	Non Pay Disconnect Converter Reauthorization
OUT	Outage Verification
PIN	PIN Number Request
PPV	Pay Per View Order
PVI	Pay Per View Information Request
UPG	Service Upgrade

Data Transaction Token				
Token	Length	Type	A=ARU I=ICOMs	Description
AN	9	digit	A	Subscriber account number (right justified, zero filled)
CH	9	digit	I	Event Channel Number
DN	4	digit	A	DNIS (Phone number customer called in to)
DT	7	digit	A,I	Date-CYYMMDD C=Century Code; Y=Year; MM=Month; DD=Day
DW	1	char	I	Day of Week-1=Sunday; 2=Monday; ..., 7 = Saturday
P#	4	char	A	Customer PIN number
PT	2	char	I	7 digits (99999.99) followed by a sign field (-=credit)
RV	2	digit	I	Rating Value
TM	4	digit	A,I	Time of Day: HHMM HH=Hour; MM=Minute
TS	11	char	A	PPV Title Code and Showing Number (6 char & 5 digit)

Response Codes	
Code	Description
000	Transaction Successful
001	Update (UP) required to perform request
101	Account Number (AN:) required
102	Phone Number (PN:) required
106	PIN (P#:) required
108	Event Number (EV:) required
201	Account Number (AN:) not found
202	Phone Number (PN:) not found
203	Duplicate Phone Number (PN:) found
204	Invalid PIN (P#:)-possible response on any transaction with P#
205	Account is not active
206	Account failed credit check
209	PIN# is not valid for event rating
215	No addressable equipment for account

220	Event Number (EV:) not found
222	Invalid DNIS (DN:)
223	No open window for pay per view order
226	Pay per view cannot be ordered for a customer with multiple converters
227	Pay per view is restricted for this customer
228	No events available for inquired category
242	Channel is restricted
243	Event already ordered
901	Invalid syntax (missing comma, colon, or period)
902	Unknown Transaction Type
903	Unknown Data Token
904	Invalid Source Identifier
905	Invalid Data Token for this Transaction Type
907	Invalid Data Value for Data Token
910	Account Number/Phone Number passed, not numeric

As part of the call routing application, the IVR sends a data request to the data server along with the calling customer's telephone number 22. The data server looks up the customer information and sends it back to the IVR to be saved in a temporary storage container (e.g., table) 24 for use during the remainder of the call. In one embodiment, the temporary storage container holds the following data:

DTA Temp Table

Field Name	Data Type	Description
Start Time Stamp	Date & Time	Date and time the call began
DNIS	Char(7)	DNIS associated with the call
Call ID	Char(4)	CallCenter call ID for cross-reference
Phone Number	Char(10)	ANI or phone number entered by the caller
Account Number	Char(9)	AN value provided on successful DTA transaction
Credit Limit	Char(10)	CL value provided on successful DTA transaction
Zip Code	Char(9)	ZP value provided on successful DTA transaction
PPV Capable	Char(3)	PC value provide on successful DTA transaction
House Locator Codes	Char(8)	HL value provided on successful DTA transaction
Node ID	Char(5)	ND value provided on successful DTA transaction
Customer Billing Type	Char(1)	BT value provided on successful DTA transaction
Category Totals	Char(15)	CT value provided on successful DTA transaction
Site ID	Char(3)	SI value provided on successful DTA transaction
Last Activity*	Char(8)	corresponds to last FFFFFFFF from Winset display
Last Response*	Char(3)	corresponds to last ICOMS response code
End Time Stamp*	Date&Time	Date and time the call ended

The retrieved account number is moved into Data Variable B 26. An Application Parameter Table, such as the PPV application parameter table listed below, is referenced to determine whether a credit/collections check needs to be conducted for the called application 28

5 (the Application Parameter Table is populated per each called number).

PPV APPLICATION PARAMETER TABLE

Field Name	Data Type	Description
DNIS	Char (7)	DNIS identifying a specific Cox location or customer, or Pay Per View event (first 3 digits identify site ID)
Site ID	Char (3)	3-digit site identifier used as override for first 3 digits of DNIS (refer to Information Systems Environment)
Business Hours CCT	Integer	CCT to transfer callers to during business hours
After Hours CCT	Integer	CCT to transfer callers to after hours or on holidays
Collections CCT	Integer	CCT to transfer callers to for collections
Collections Flag	Char (1)	Y/N flag indicating whether callers are transferred to the Collections CCT if their credit status is unacceptable
Alternate Transfer Flag	Char (1)	flag indicating whether to use standard CCTs or to lookup alternate transfer CCT based on flag type in Alternate CCT Table (valid values of flag are null=standard CCT; Z=zip code; N=node ID; P=primary locator code; S=secondary locator code)
Account Transfer Flag	Char (1)	Y/N flag indicating whether caller must enter an account number to access the Account Balance Inquiry function
PPV Adult Flag	Char(2)	null if Adult events not offered; PPV Type Code if Adult is available (corresponds to Adult PPV Type Code)
PPV Adult Rating	Char(2)	minimum rating value for ordering Adult events (01-99)
PPV Menu Method	Char(1)	method for presenting PPV menu options (valid values are C (continuous: to select event A, press 1; to continue reviewing events, press 2) or D (discrete: for event A, press 1: for event B, press 2; for event C, press 3...))
PPV Menu 1	Char(2)	2-character code for event type corresponding to PPV Type Code (PT token); null if menu option not offered
PPV Menu 2	Char(2)	2-character code for event type corresponding to PPV Type Code (PT token); null if menu option not offered
PPV Menu 3	Char(2)	2-character code for event type corresponding to PPV Type Code (PT token); null if menu option not offered
PPV Menu 4	Char(2)	2-character code for event type corresponding to PPV Type Code (PT token); null if menu option not offered
PPV Menu 5	Char(2)	2-character code for event type corresponding to PPV Type Code (PT token); null if menu option not offered
PPV Quantity 1	Integer	number of PPV events returned from the host per PV1

		request for Menu 1 (value 01-99 used in QT token)
PPV Quantity 2	Integer	number of PPV events returned from the host per PV1 request for Menu 2 (value 01-99 used in QT token)
PPV Quantity 3	Integer	number of PPV events returned from the host per PV1 request for Menu 3 (value 01-99 used in QT token)
PPV Quantity 4	Integer	number of PPV events returned from the host per PV1 request for Menu 4 (value 01-99 used in QT token)
PPV Quantity 5	Integer	number of PPV events returned from the host per PV1 request for Menu 5 (value 01-99 used in QT token)
PPV Extra Option Flag	Char(1)	Y/N flag indicating whether or not an "extra" option will be offered after a caller orders a PPV event
PPV Confirmation	Integer	determines the method for PPV order confirmation: 0=no confirmation required-event is always ordered; 1=hangup is confirm (pr 1/hang to confir, 2 to cncl);2=hangup is cancel (pr 1 to confir, pr 2/hang to cncl)

If a collection flag is indicated in the Application Parameter Table, the customers credit CL is retrieved from the temporary storage container to determine whether the caller has bad credit 30. If the caller does have bad credit, the switch is instructed (or a collections status flag is set for the switch) to initiate a collections process 32, which preferably involves transfer of the call to a collections agent (and call data via the data variables). The initial call control process flow of **Figure 2** is specific to the dialed number received at the switch. The dialed number for the call control flow of **Figure 2** relates to a main menu telephone number where the caller is given a menu of choices for further call processing 34. A different initial call control process would be initiated if the caller dialed a number dedicated to ANI based PPV. In such a case, the ANI PPV application on the IVR would be automatically called after the calling customer was validated through the call routing application.

As discussed above, if the calling party's number is located on the data server, customer data from the ICOMS database will be written to the temporary data table for further processing by the IVR; and data will be passed back to the switch to provide the initial call control process with information on how to proceed with the call (e.g., allow the customer to proceed to another

IVR application, transfer the caller to a live agent, or transfer the customer to a collections representative). After the Call Routing Application is run, a Parameter Table, such as the Xfer Parameter Table listed below, is referenced to determine whether ANI PPV or MENU PPV selections are offered to the caller by initiating the specific call control process associated with each application.

Xfer_Parameter_Table

This table contains information specific to the routing of callers to the ACD from the Call Routing Application and from all IVR applications. The table is read to determine the appropriate CCT for the transfer. The index key is comprised of DNIS and Language.

Field Name	Data Type	Description
<i>DNIS</i>	VarChar(7)	DNIS identifying a specific Cox location or customer type, or Pay Per View event; corresponds to the original DNIS supplied with the call, and subsequently stored in the DTA Temp Table **
<i>Language</i>	Char(2)	2-character code for language of spoken prompts (EN = English or SP = Spanish)
Site_ID **	Char(3)	3-digit site identifier used as override for first 3 digits of DNIS (for Data Directed Routing purposes only)
Business_Hours_Menu	Number(3)	Default CCT number for Main Menu during business hours
After_Hours_Menu	Number(3)	Default CCT number for Main Menu after hours or on holidays
Business_Hours_CCT	Number(3)	Default agent CCT for call transfers during business hours
After_Hours_CCT	Number(3)	Default agent CCT for call transfers after hours or on holidays
Collections_CCT	Number(3)	Default CCT for call transfers when the customer account is in a bad credit status - this field must always have a value of at least '0'
Collections_Flag	Char(1)	Y/N flag indicating whether callers are transferred to the Collections CCT if their credit status is unacceptable

Alternate_Xfer_Flag	VarChar(10)	Flag indicating whether to use standard transfer CCTs or to lookup alternate transfer CCT based on customer data as specified in the Alternate CCT Table. Valid values are: "default" to use values in Xfer_Parameter_Table "zip-9" for 9-digit zip code (entire ZP token); "zip-5" for 5-digit zip code (first 5 bytes of ZP token); "node" for node ID (ND token); "primary" for primary housing locator code (first 4 bytes of HL token); "secondary" for secondary housing locator code (last 4 bytes of HL token); "application" for call flow specific transfer
Alternate_Menu_Flag	VarChar(10)	Flag indicating whether to use standard Menu CCTs or to lookup alternate Menu CCT based on customer data as specified in the Alternate CCT Table. Valid values are the same as those for the Alternate Xfer Flag field.
Default_Hours_Flag	Char(1)	Y/N flag indicating whether to use the default business hours (Y) or DNIS-specific business hours (N). Business hours and holidays are stored in the <i>Business Holiday Table</i> .
Default_Holiday_Flag	Char(1)	Y/N flag indicating whether to use the default holidays (Y) or DNIS-specific holidays (N). Business hours and holidays are stored in the <i>Business Holiday Table</i> .
Xfer_Call_In_Number	Char(10)	Represents the local or 800 number associated with this DNIS; for reference purposes only.
DTA_Long_Lead_Flag	Char(1)	Y/N flag indicating whether or not to execute the Long Lead logic in Data Directed Routing.

The PPV ordering application of the present invention allows callers to order PPV events by either dialing an event-specific phone number or by selecting an event from a voice prompted menu. As discussed above, the PPV applications are engaged after the initial call control process and call routing application identifies the caller's phone number and retrieves the customer account number and other customer data.

In the preferred embodiment, the switch will call the appropriate PPV application on the IVR (PPVANI/DNIS or PPVMENU) and pass the caller phone number, account number and called number to the IVR via the Data Variables. The PPV applications running on the IVR will use this data to accomplish the PPV functions according to the present invention. If certain caller status is such that it prevents operation of the PPV application, the call may be transferred to a

live agent and data is passed to the agent via Data Variable E. A CTI link may be used to pass the data to the live agent.

If a caller dials an event-specific phone number (ANI PPV application), the IVR will use the called number to validate the event and process the order. If the caller dials into a main customer service number and selects the PPV option, the IVR will use the system settings to prompt the caller through a series of menus for selecting a desired PPV event. The caller may be required to enter a PIN number in order to view certain types of events based on their account profile and system settings.

Figures 3A-3C illustrate one embodiment of the ANI PPV ordering system of the present invention. The called number PPV ordering process of the present invention uses a PPV Parameter Table that may be set to custom configure the application. The system accesses this PPV Parameter Table to first determine which prompts to play the caller (shown generally at **40**).

A PPV data request is sent to the data server **42** to retrieve information relating to the event ordered. If a PIN number is required, the caller is prompted to input it **44** via the touch-tone phone. The PIN number is validated against the customer database **46**. In one embodiment, a customer rating system is used wherein each customer and event is assigned a numerical rating number (e.g., higher ratings for adult content material) **48**. If the customer's rating is higher than the rating of the requested event, the customer is allowed to receive the event. The feature allows concerned parents to set their ratings lower to prevent their children from viewing adult programming at various levels. Once the customer has been validated, the customer is given a prompt reviewing the details of the event ordered **50**.

Figures 4A-4G illustrate one embodiment of a menu pay per view ordering call flow of the present invention. The application retrieves customer data from the temporary data storage

container and PPV application parameters from the PPV parameter table 52. The caller is played a category menu and is asked to select a category 54. If the adult category is selected, the data server is accessed to obtain the caller's rating based on the caller's PIN 56, see Figure 4B.

A PPV information request is made to the data server 58 to obtain PPV information. The event information is played to the caller 60 who may select the event desired. If the caller does not wish to order the first-offered event, the application will loop to the next event and prompt the caller with information about the event 62. If the caller wishes to order the event 64, the caller indicates so by the touch-tone phone. The PPV order transaction is sent to the data server 66 (see Figure 4F) to process the order.

Having shown and described a preferred embodiment of the invention, those skilled in the art will realize that many variations and modifications may be made to affect the described invention and still be within the scope of the claimed invention. Thus, many of the elements indicated above may be altered or replaced by different elements, which will provide the same result and fall within the spirit of the claimed invention. It is the intention, therefore, to limit the invention only as indicated by the scope of the claims.